

# Algebra II - Statistics Exam Review

Key 1

1. Modify this set of data so that you have at least two of the following: at least one Mode of 10, a Median of 11, a Mean of 12.

10.6	9.9	11.5	11.5	12.3	12.1	10.9	12.7	11.5	10.3	10.8
12.2	12.5	10	11.9	10.9	10.9	9.8	9.3	10.4	11.6	

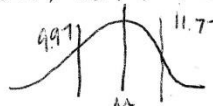
10.6	9.9	11.5	11.5	12.3	12.1	11	10	10	10.3	11
10	12.5	10	11.9	11	11.1	9.8	9.3	10.4	11.6	

2. Explain the process used to adjust this set of values.

TO MAKE THE MODE 10, I NEEDED TO ADD SOME 10 VALUES,  
 TO GET THE MIDDLE NUMBER TO BE 11, I HAD TO CHANGE SOME OF THE 10.9 VALUES

3. Test the Normality of this set of data.

TESTING THE NEW DATA SET: MEAN  $\approx 10.85$  MODE = 10 MEDIAN = 11 - CLOSE  
 STD = 0.92



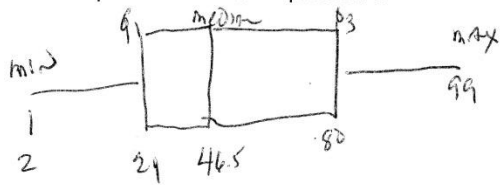
COUNT 14 DATA PTS  $\pm 1$  STD  
 $0.68$  OF 21 = 14.28 - CLOSE

4. Given this set of data discover the 5 Number summary.

70	2	11	80	37	51	49	92	40	18	44	99	24	95
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$MIN = 2$        $MEDIAN = 46.5$        $Q3 = 80$   
 $Q1 = 24$        $MAX = 99$

5. Create a Box-and-Whiskers plot for the data in question 4.



6. Determine a value that would be an outlier for the data in question 4 and explain your rationale.

$1.5 IQR = Q3 - Q1 = 56$        $\left\{ \begin{array}{l} Q1 - (56)1.5 = -63 \rightarrow -64 \\ Q3 + (56)1.5 = 164 \rightarrow 165 \end{array} \right.$   
 $STO_{SAMPLE} = 31.9997$   
 $MEAN = 50.8571$        $\left\{ \begin{array}{l} MEAN + 3 \cdot STD = 146.856 \\ MEAN - 3 \cdot STD = -45.1418 \end{array} \right.$   
 $147$   
 $-46$

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②

7. Given the following set of data, determine the second best functional model and explain how you came to know this.

Time	13	14	15	16	17	18	19	20	21	22	23	24
Relative Humidity	0	2	6	11	19	28	38	50	63	79	96	100

$Q_{\text{quartic}} \Rightarrow R^2 = 0.998107$        $f(t) = -0.02138t^3 + 4.0226t^2 - 74.648t + 424.56$   
 $Q_{\text{cubic}} \Rightarrow R^2 = 0.996463$

8. What are the two probabilities when you collect a even numbered card while making two draws from a deck of cards? Explain how these two answers differ and why. (2,4,6,8)

$\frac{4}{13} \cdot \frac{4}{13} = \frac{16}{169} \approx 0.095$        $\frac{4}{13} \cdot \frac{5}{17} = \frac{20}{221} \approx 0.0905$   
 With Replacement Independent      Without Replacement Dependent

9. Compare and Contrast two of the 2 of the measures in the 5 Number summary.

$Q_1$  &  $Q_3$       Both divide into half      Both can be modes  
 $Q_1$  is lower than  $Q_3$       Neither can be the median (most of the time)  
 Both are part of 5# summary

10. Calculate the Variance and Standard Deviation of this set of data that came from a sampling of students taking the Algebra 2 Examination on Series and Sequences.

53    97    65    74    69    61    55    97    60    57    96    69

$\text{VARIANCE} = 275.174$        $\sqrt{275.174} = \text{STDEV} \approx 16.5884$

11. Applying the context to the data set in question 10, state the domain, range and one other statistical measure related to the data. Explain how this additional measure relates to the context.

Domain 0 to 100       $0 \leq \text{score} \leq 100$       Mean 71  
 Range of data 53 to 97       $\rightarrow$  rounded value to show score

12. If one city reports a mean annual income of \$43,000 another reports a median annual income of \$43,000, and a third reports a mode for annual income of \$43,000, what can you conclude from this data from the POV of your best chance to earn the highest income if you moved there. Explain your logic.

Median  $\Rightarrow$  HALF OF THE pop makes more than 43k  
 Mode  $\Rightarrow$  At least two folks make 43k  
 Mean  $\Rightarrow$  Tells me Very little  
I would pick  
Median

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KEY

(3)

13. It is said that the mean for the value of US coins is not the value of any of the coins. Explain. Would this be True for the Median value of US coins? The Mode for the value of US coins?

$$0.01 + 0.05 + 0.10 + 0.25 + 0.50 + 1.00 = 1.91$$

$$n = 6$$

$$\text{MEAN} = 31.833\bar{3} \text{ - Not A coin value}$$

NO mode

$$1 \ 50 \mid 25 \ 50 \ 100$$

$$\frac{10+25}{2} = 17.5 \text{¢ Not A coin}$$

TRUE - TRUE FALSE

14. What is the probability of flipping a coin 3 times and getting all 3 outcomes being a tail? What would the probability be of an outcome being a tail when you flip again?

$$\frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} = \frac{1}{8} \approx 0.125$$

$$\frac{1}{2} = 0.5$$

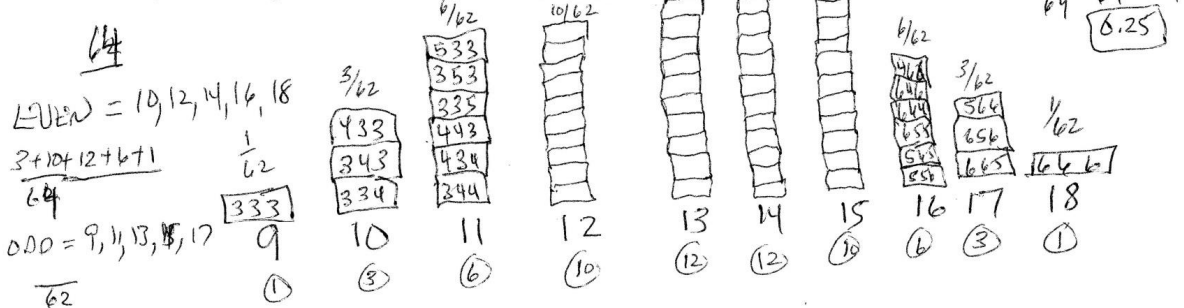
15. Given this response from the Algebra 2 Survey, explain how this data compared to the categories you analyzed in your mini-project.

1. How many people are in your family?	7
2. How many pets does your family have in your household?	7
3. How many TV are in your house?	7
4. What is the walking time from your home to school?	28
5. How many states have you visited?	21
6. How many times have you been camping?	7
7. How many other countries have you visited?	14
8. How many times have you flown in a plane?	35
9. How many books do you read in a typical year?	7
10. How many hours of TV did you watch last night (or on a typical night)?	0
11. How many hours do you spend daily (on average) on a computer?	7
12. Pick your favorite number between one and seven, inclusive.	1
13. Pick a color from this list.	Green
14. If you were given a choice of grand prizes which one would you pick?	Van

12 13 14 15  
 345 346 444 555  
 354 364 464 663  
 534 634 644 636  
 543 643 653 366  
 435 463 635 654  
 453 436 365 645  
 336 445 536 465  
 363 454 563 456  
 636 544 356 546  
 444 553 564 564  
 535 545  
 355 454

Question 5 - I found mean was 14.4 STATES - This was over 10  
 Q10 vs. Q3 - I compared # of TVs with hours watching - I expected a positive correlation  
 my function predicted it would be 7 TVs would watch 2 hrs of TV  
 This was 2 - much lower

16. Create a probability pyramid for throwing three 4-sided dice numbered (3-4-5-6). What is the probability of throwing an even number and then an odd?



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KEY (4)

17. Is the scenario in question 16 an Independent or Dependent event? How could you change it to be the other type of event?

INDEPENDENT AFTER THE 1st THROW OF 3 DICE  
REMOVES ONE DIE + THROW 2  
DICE NEXT TIME

18. Determine the Correlation Coefficient for the 4 plots below.

